

WHAT IS CLAIMED IS:

1. A line card and backplane combination for reduced EMI emissions comprising:

a backplane;

5 a printed circuit board;

a printed circuit board carrier attached to the printed circuit board;

a bracket having a first leg and a second leg, the first leg electrically contacting the backplane; and

10 a clip electrically engaged with the second leg, the carrier, and the printed circuit board.

2. The combination of Claim 1, wherein:

the printed circuit board has a length;

15 the bracket has a length that is at least a majority of the length of the printed circuit board; and

the clip is electrically engaged with the second leg, the carrier, and the printed circuit board over the length of the bracket.

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3. The combination of Claim 1, wherein the bracket comprises a right angle bracket having the right angle formed by the first leg and the second leg.

25 4. The combination of Claim 1, wherein the clip is formed from beryllium copper.

30 5. The combination of Claim 1, wherein the carrier comprises a flat portion and a plurality of standoffs extending from the flat portion.

6. The combination of Claim 1, wherein the bracket has a length that is substantially the same as the length of the printed circuit board carrier.

5 7. The combination of Claim 1, and further comprising a printed circuit board receiver formed on the backplane substantially parallel to the bracket, the receiver engaged with the printed circuit board.

10 8. The combination of Claim 1, wherein the clip comprises a clip having a cross section that comprises two curved sections adapted to receive the first leg therebetween and first and second flat sections, the first flat section engaging the printed circuit board and  
15 the second flat section affixed to the carrier.

9. The combination of Claim 1, wherein the clip comprises a clip having a cross section having two disconnected portions.

20 10. The combination of Claim 1, wherein the EMI clip comprises a clip having a cross section that comprises two curved sections adapted to receive the first leg therebetween and a third curved section  
25 connecting the two curved sections together.

11. The combination of Claim 1, wherein the printed circuit board comprises a motherboard.

12. A telecommunications backplane comprising:  
a conductive plate;  
a printed circuit board receiver formed on the plate  
and operable to engage a printed circuit board, the  
5 printed circuit board receiver having a length; and  
a connector coupled to the conductive plate  
substantially parallel to the printed circuit board  
receiver and having a length that is at least a majority  
of the length of the printed circuit board receiver.

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13. The backplane of Claim 12, wherein the  
connector is a right angle bracket having a first leg and  
a second leg.

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14. The backplane of Claim 12, wherein the  
connector comprises a clip disposed within a U-bracket.

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15. The backplane of Claim 12, wherein the printed  
circuit board receiver and the bracket are approximately  
the same length.

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16. The backplane of Claim 12, wherein the printed  
circuit board comprises a plurality of electrical  
connectors for receiving respective electrical connectors  
formed on a printed circuit board.

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17. The backplane of Claim 12, wherein the  
backplane further comprises a plurality of conductive  
traces electrically connected to the printed circuit  
board receiver.

18. The backplane of Claim 12, wherein the right angle bracket is a continuous bracket.

19. The backplane of Claim 12, wherein the right angle bracket comprises a plurality of segments disconnected from each other and wherein the length comprises the sum of all lengths of the segments.

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20. A printed circuit board and carrier combination comprising:

a plate having a length and an edge;

an EMI clip electrically engaged with and extending  
5 a substantial portion of the length of the plate and  
formed proximate to the edge;

a plurality of standoffs extending from the plate;  
and

10 a printed circuit board affixed to the standoffs and  
engaged with the clip.

21. The combination of Claim 20, wherein the clip  
comprises two opposing receiving sections operable to  
receive a leg of a bracket therebetween.

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22. The combination of Claim 20, wherein the clip  
is affixed to the printed circuit board.

20 23. The combination of Claim 20, wherein the EMI  
clip extends the length of the plate.

24. The combination of Claim 21, wherein the EMI  
clip further comprises first and second flat portions,  
the first flat portion engaged with the printed circuit  
25 board and the second flat section engaged with the  
carrier.

25. The combination of Claim 20, wherein the EMI  
clip comprises a clip having a cross section having two  
30 disconnected portions.

26. The combination of Claim 20, wherein the EMI  
clip comprises a clip having a cross section that  
comprises two curved sections adapted to receive the  
first leg therebetween and a third curved section  
5 connecting the two curved sections together.

27. A method for reducing EMI emissions comprising:  
providing a backplane having a plurality of printed  
circuit board receivers and a plurality of respective EMI  
reduction connectors formed parallel to the respective  
5 printed circuit board receiver, each connector having a  
length approximately the same as the length of the  
respective printed circuit board receiver;  
for each printed circuit board receiver;  
connecting an associated printed circuit board  
10 to the respective printed circuit board receiver;  
electrically coupling an associated printed  
circuit board carrier to the EMI reduction connector by  
an EMI clip; and  
electrically coupling the printed circuit board  
15 to the EMI reduction connector by the EMI clip.

28. The method of Claim 27, wherein:  
each EMI reduction connector has a length  
approximately the same as the length of the respective  
20 printed circuit board receiver; and  
wherein electrically coupling an associated printed  
circuit board carrier to the EMI reduction connector by  
an EMI clip comprises electrically coupling an associated  
printed circuit board carrier to the EMI reduction  
25 connector by an EMI clip over a substantial portion of  
the length of the printed circuit board carrier.

29. The method of Claim 27, wherein the EMI  
reduction connector comprises a bracket.

30. The method of Claim 27, wherein electrically coupling an associated printed circuit board carrier to the EMI reduction connector comprises electrically coupling an associated printed circuit board carrier to a 5 connector having two opposed portions adapted to receive a leg of a bracket therebetween.

31. The method of Claim 29, wherein the bracket is a right-angle bracket.

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32. The method of Claim 27, wherein at least one of the connectors comprises a continuous connector.

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33. The method of Claim 27, wherein at least one of the connectors comprises a plurality of segments disconnected from each other and wherein the length comprises the sum of all lengths of the segments.

34. A backplane and line card combination for reducing EMI emissions comprising:

a backplane;

5 a means for carrying a printed circuit board having a length;

a means disposed on the backplane for coupling the backplane to the means for carrying; and

10 a means for electrically engaging the means for carrying with the means for coupling and the printed circuit board over a substantial portion of the length of the printed circuit board.